

Appl. No. 10/615,433
Amdt. Dated 01/16/2006
Reply to Office Action of 08/16/2005

REMARKS

This is in response to the Office Action mailed 08/16/2005. In the Office Action, (i) claims 1-4, 6-20, 40-42, 46, and 48-49 were rejected under 35 USC 112, 2nd Paragraph; (ii) claims 1-4, 6, 9, 16-18, 19-20, 21-22, 23, 24-26, 29-33, 38-45, and 46-47 were rejected under 35 USC 103(a); (iii) claims 1, and 48-51 were objected to; (iv) claims 7, 8, 36, 37, and 48-51 were indicated as being allowable but objected for being dependent; and (v) the title was objected.

Reexamination and reconsideration of this case is respectfully requested in view of the foregoing amendments and the following remarks.

Claims 1-4, 6-26, 30-33, and 35-51 were previously pending. Claims 5, 27-29, and 34 were previously cancelled without prejudice.

In this response, claims 1, 6-9, 11-14, 19, 21-22, 30-31, 35, 40-43, and 46 have been amended. Claims 4, 10, 15, 39, and 48-51 have been cancelled without prejudice. Claims 52-63 have been added. Accordingly, claims 1-3, 6-9, 11-14, 16-26, 30-33, 35-38, 40-47, and 52-63 remain at issue in the patent application. Of those pending, claims 1, 7, 8, 21, and 31 are independent claims.

Applicant believes that no new matter has been added by this preliminary amendment.

I) TITLE

The title of the invention was objected to for not being descriptive. [Office Action, Section 2, page 2].

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Applicant has amended the title to "ILLUMINATION DEVICES HAVING ROTATABLE ACRYLIC ROD AND METHODS THEREFOR".

Applicant believes this amendment to the title of invention now makes this objection moot and respectfully requests its withdrawal.

II) CLAIM OBJECTIONS - SEQUENCE OF FUNCTIONAL LIMITATIONS

Claim 1 was objected to because of an informality in the sequence in which the functional limitation of "a direction of radiation of light" was recited. [Office Action, Pages 2-3, Section 3].

Applicant doesn't know of any rule or law requiring a particular order in which claim elements and functional limitations are recited in apparatus claims. However, Applicant has amended claim 1 to clarify the claimed invention in an attempt to remedy the lack of clarity cited by the Office Action.

Applicant believes this objection is now moot and respectfully requests its withdrawal.

III) CLAIM OBJECTIONS - REDUNDANT LIMITATION

Claims 48-49 and 50-51 were objected to under 37 CFR 1.75 as being substantial duplicates of claims 7-8 and 36-37, respectively. [Office Action, Page 3, Sections 4-5].

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Applicant has cancelled claims 48-51 and now believes these objections are moot and respectfully requests their withdrawal.

IV) CLAIM OBJECTIONS - DEPENDENCY

Claims 7-8 and 36-37 were objected to for being dependent upon a rejected base claim. [Office Action, page 22, section 14].

Applicant has amended claims 7-8 into independent form including some but not all of the limitations of independent claim 1. However, independent claims 7-8 continue to recite the specific limitations cited in the Examiner's statement for reasons of allowance that "the diameter or length of the acrylic rod being proportional to a desired frequency of light". [Office Action, page 18, section 23].

Claims 36-37 were not amended into independent form and remain depending from independent claim 31. The claim rejections of independent claim 31 are addressed below.

In light of the following remarks, Applicant believes that it has placed independent 31 in condition for allowance such that dependent claims 36-37 depending there-from with added limitations are also in condition for allowance.

Thus, it is believed that this objection to claims 7-8 and 36-37 is now moot and its withdrawal is respectfully requested.

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V) CLAIM REJECTIONS - 35 USC § 112, 2nd paragraph

Claims 1, 11-13, 19, 40-42, and 46 were specifically rejected under 35 USC § 112, second paragraph as being indefinite. Claims 2-4, 6-20, 48, and 49 were also rejected for being dependent on claim 1. [Office Action, Pages 4-5, Sections 6-8] Applicant respectfully traverses this rejection.

Applicant has cancelled claims 12-13, and 41-42 such that this rejection of these claims is now moot.

Applicant has amended the rejected claims 1, 11, 19, 40, and 46 to clarify the claimed invention.

Claims 1, 7, 8, 31 have been amended to substantially recite "the rotatable acrylic rod being rotatable within the [] opening of the []housing to change the direction of the reflected photons" to clarify the claimed invention.

To clarify the claimed invention, claims 11 and 40 have been amended to initially recite that "the rotatable acrylic rod is a circular cylinder having a circumference" and then recites that "along the length of the rod, the reflective strip encompasses a portion of the circumference of the rotatable acrylic rod over a range from forty five degrees to one hundred eight degrees inclusively."

To clarify the claimed invention, claims 19 and 46 have been amended to initially recite that "the one or more light emitting diodes (LEDs) are a plurality of light emitting diodes (LEDs) each to generate a different color of light" and then recite that "the light further includes a color selection switch to selectively choose a mixture of primary colors generated by

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the plurality of light emitting diodes (LEDs) to vary the color of the generated light."

Applicant believes this amendment now makes these rejections moot and respectfully requests the withdrawal of all the 35 U.S.C. § 112, second paragraph claim rejections of claims 1-4, 6-20, 40-42, 46, and 48-49.

VI) FUNCTIONAL LIMITATIONS IN CLAIMS

The Office Action points out that recitations to given abilities of a claimed structure carry little patentable weight. The Office Action cites In re Hutchinson, 69 USPQ 138 ((CCPA 1946) for recitations that claim an element as "adapted" or "capable" to perform a function or serve in a given application are not positive limitations, but only require the ability to so perform.

Applicant has reviewed In re Hutchinson, copy attached hereto as Appendix I, and can find no general rule such as this. Hutchinson mentions that in the introductory clause (i.e., the "preamble"), "the laminated article 'adapted' for use in making a template or the like" did not constitute a limitation in a patentable sense. However, this is not a general rule as to functional language of elements in a claim.

Applicant has reviewed the claims and can find no use of "adapted" or "capable" recited therein. Additionally with the amendment to claim 31, the preambles ("introductory clauses") of Applicant's apparatus claims are now short and do not recite long introductory clauses. Only does Applicant's method claim

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21 have a preamble with more than a few words to put the method in context.

Moreover, MPEP 2173.05(g) recites more current rules and procedures with respect to functional limitations. "A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re Swinehart, 439 F.2d 210, 169 USPQ 226 (CCPA 1971). ***A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.*** A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step. (Emphasis Added) [MPEP § 2173.05(g), 8th Edition, Rev. 3, August 2005, Page 2100-221].

Applicant respectfully requests that the limitations of Applicant's claims be fully considered.

VII) CLAIM REJECTIONS - 35 USC § 103(a)

Claims 1-4, 6, 9-18, 21-22, 24-26, 30-33, 35, and 38-45 were rejected under 35 USC § 103(a) as being obvious over the combination of U.S. Pat. No. 6,135,621 issued to Kent Bach

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("Bach") in view of U.S. Pat. No. 4,924,357 issued to Yamashita et al. ("Yamashita"). [Office Action, Pages 6-15, Sections 9-16] Applicant respectfully traverses this rejection.

Claims 19-20, 23, and 46-47 were rejected for being obvious under 35 USC § 103(a) over the combination of Bach, Yamashita and US Patent No. 4,992,704 issued to Stinson. ("Stinson"). [Office Action, pages 15-17, Sections 17-21]. Applicant respectfully traverses this rejection.

A) Independent Claims

Regarding independent claims 1, 21, and 31, the Office Action alleges in part that Bach discloses

"- a rotatable rod (as recited in claims 1 and 31), Figure 4, reference number 12;"

...

"- the acrylic rod being rotatable within the first end housing (as recited in claims 1 and 31), as evidenced by Figure 4;"

... and

"- the rod being rotatable within the second end housing (as recited in claims 4 and 31), as evidenced by Figure 4;"

Applicant respectfully disagrees.

There is no support in Bach to suggest that Bach's bar 12 is rotatable. Applicant has searched Bach for the words "rotate", "turn", "aimable", and "rotatable". There is no occurrence of any of these words therein. There is no discussion in Bach that Bach's bar 12 rotates or is aimable.

Instead, Bach teaches away from a rotatable bar. Bach's "first curved mirror 18 surrounds the first light source 14. The first curved mirror 18 is of a diameter smaller than that of the

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bar 12, and **attaches to the first end 11 of** and encloses the bar 12." (emphasis added) [Bach, Col. 2, lines 15-19]. As illustrated in Bach's Figs. 2 and 4, Bach's first curved mirror 18 is attached to the first end of the bar 12 and surrounds the light source 14. With Bach's light source 14 being **perpendicular** to Bach's bar 12 and **surrounded by Bach's mirror 18**, as illustrated in Bach's Figs. 2 and 4, **it will prohibit rotation of Bach's bar 12.**

"It is improper to combine references where the references teach away from their combination." [MPEP §2145(X.D.2), 8th Edition, Rev. 3, August 2005, Pg. 2100-169; citing In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)] "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." [MPEP §2141.02(VI), 8th Edition, Rev. 3, August 2005, Pg. 2100-132; citing W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)].

Further, Applicant has amended independent claims 1 and 31 to include the limitation of a "reflective strip" found in dependent claims 10 and 39, respectively. (Claims 10 and 39 are now cancelled without prejudice). Applicant has also amended independent claim 21 replacing limitations of "radiating" and "radiate" with --reflecting-- and --reflect--, respectively.

The Office Action admits that Bach doesn't disclose a reflective strip but alleges instead that Yamashita discloses:

"a reflective strip (as recited in claims 10 and 39), figures 4A-4E, reference number 30;

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the reflective strip being coupled down the length of the rod (as recited in claims 10 and 39), as seen in figures 4A and 4B;

the reflective strip being for reflecting photons out of the rod (as recited in claims 10 and 39), column 6, lines 37-46."

Applicant respectfully disagrees.

As illustrated in Yamashita's Figure 4A-4E, Yamashita's aluminum cylindrical mirror 30 substantially covers over Yamashita's rod 22 with only "a slit 28 at a position opposed to said diffusion stripe 24 ... whereby the outer circumferential surface of the light transmitting rod 22 is protected." [Yamashita, Col. 3, lines 50-55].

Moreover, Yamashita's aluminum cylindrical mirror 30 functions differently. In Yamashita, "a secondary light beam is reflected inside the light transmitting rod 22 by means of the cylindrical mirror 30 ... to return [it] to the diffusion stripe 24." [Yamashita, Col. 6, lines 40-43]. In Yamashita's, "light in the light transmitting rod 22 is emitted by [] by means of the diffusion stripe 24". [Yamashita, Col. 4, lines 57-59]. "Only the primary light beam A of the incident light [is emitted to] enter[] the rod lens 46 by means of the diffusion stripe 24 through the slit 28." [Yamashita, Col. 7, lines 8-10].

That is, Applicant respectfully submits that Yamashita's aluminum cylindrical mirror 30 does not disclose a "reflective strip to reflect photons outwards through the rotatable acrylic rod" as recited in independent claims 1 and 31 nor does it disclose "reflecting the first photons out of the rotatable

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acrylic rod as light in a first direction" as recited in independent claim 21.

To reject a claimed invention for being obvious, "the prior art reference (or references when combined) must teach or suggest all the claim limitations." [MPEP § 2142; 8th Edition, Rev. 3, August 2005, Pg. 2100-134; citing In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)].

For at least the foregoing reasons, Applicant respectfully submits that the combination of Bach and Yamashita does not make obvious Applicant's invention claimed in independent claims 1, 21, and 31.

B) Official Notice

Regarding the LED limitation of independent claims 1 and 31, Official Notice is taken that the use of LEDs is old and well known in the illumination art" and that "It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute an LED for the light source in the system of BACH et al." [Office Action, section 14, page 14]. Applicant respectfully disagrees.

As discussed previously, Bach's light source 14 is perpendicular to Bach's bar 12 as is illustrated in Bach's Figs. 2 and 4. Simply substituting an LED in the position of Bach's light sources 14,32 would not properly "align the one or more light emitting diodes (LEDs) of the [first] circuit board with the [first] opening and the first end of the rotatable acrylic rod" as recited in amended claims 1 and 31. [Claim 1, lines 24-26; claim 31, lines 27-29]. More specifically, such a simple

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substitution would not place the "optical axis of each of the one or more light emitting diodes (LEDs) [] substantially in parallel with the central optical axis of the rotatable acrylic rod" as recited in amended claims 1 and 31. [Claim 1, lines 27-30; claim 31, lines 30-33].

Moreover with LEDs being simply substituted, no longer would Bach's first light source 14 emit[] light in all directions." [Bach, Col. 2, lines 40-41]. Substantial modifications to the physical structures of Bach would be required in order to properly replace Bach's light sources 14,32 with LEDs.

It is not a proper ground of rejection when the "suggested combination of references would require a substantial reconstruction and redesign of the elements." [MPEP § 2143.01, 8th Edition, Rev. 2, May 2004, Pg. 2100-132 and *In re Ratti*, 270 F2d. 810, 123 USPQ 349 (C.C.P.A. 1959)].

Accordingly, Applicant respectfully submits that it would not have been obvious to one of ordinary skill in the art at the time the invention was made to substitute LEDs for the light sources in Bach.

C) Dependent claims

Applicant has cancelled claims 4, 10, 15, and 39 without prejudice. It is believed the claim rejections of these claims are now moot.

Regarding dependent claims 17 and 44, the Office Action alleges that the structural limitations of an electrical-to-

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optical controller and an on/off switch are inherently disclosed by Bach. Applicant respectfully disagrees.

Bach's light sources 14,32 use incandescent light bulbs that require no control. Moreover, Bach's Figure 4 seems to illustrate a pair of wires emanating from Bach's light sources 14,32 to directly couple to an AC or DC power source.

Regarding dependent claims 18 and 45, the Office Action alleges that Bach's column 1, lines 44-46 discloses Applicant's "intensity selection switch to vary the brightness of the generated light". Applicant respectfully disagrees.

Bach's column 1, lines 44-49 in the "SUMMARY OF THE INVENTION" section, recite "The illuminated handle of the present invention results in increased luminosity of the surface of the bar. It also permits many different lighting effects by varying the diffusion, field of visibility, and brightness of the light. The light can be of different colors, and the bar may be clear or translucent or color coated." [Bach, Col. 1, lines 44-49]. However, Bach does not disclose the structure of an "intensity selection switch to vary the brightness of the generated light" as recited in Applicant's claims 18 and 45. In contrast, Bach discloses "[t]he body of bar 12 may have within it metalescent flakes or glass dust embedded therein. The surface may also be frosted, or made different colors. This would vary the diffusion and/or visibility of the light to meet the application in which the invention is used." [Bach, Col. 2, lines 26-30].

Regarding dependent claims 11, 12, 13, 40, 41, and 42, the Office Action relies on legal precedent when it states "it would be obvious to one skilled in the art at the time the invention

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was made to select such values, since it has been held that discovering an optimum value of a result effective variable [*in a known process*] involves only routine skill in the art. *In re Boesch* [and Slaney], 617 F.2nd 272, 205 USPQ 215 (CCPA 1980). In this case, selecting a specific value for the coverage of the reflector around the rotatable acrylic rod would have flown naturally to one of ordinary skill in the art as necessitated by the requirements of a particular application." (emphasis added) [Office Action, Section 15, pages 14-13]. A copy of *In re Boesch* and Slaney is provided in Appendix II.

If the facts in a prior legal decision are not sufficiently similar to those in an application under examination, the examiner may not use the rationale used by the court. Additionally, "If the applicant has demonstrated the criticality of a specific limitation, it would not be appropriate to rely solely on case law as the rationale to support an obviousness rejection." [MPEP § 2144.04, 8th Edition, August 2005; page 2100-144].

In re Boesch and Slaney involved composition of matter claims directed to a nickel base alloy and not apparatus claims. More importantly, the rule applied by *In re Boesch* and Slaney is directed to a *known process*. (emphasis added). That is, "the ranges of constituents in appellant's claimed alloys overlap[ped] ranges disclosed by [the prior art]". The Office action has not shown a prior art reference that discloses Applicant's ranges or specific angles of circumference encompassed by the Applicant's reflective strip.

Moreover, Applicant's ranges or specific angles of circumference encompassed by the Applicant's reflective strip

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are important so that photons can be reflected out of the rotatable acrylic rod.

Thus, Applicant respectfully submits that the facts in *In re Boesch* and *Slaney* are not substantially similar to the facts in Applicant's patent application and the rejection of Applicant's claims.

Regarding dependent claims 19-20, 23, 46-47, the Office Action admits that the combination of Bach and Yamashita does not disclose limitations of these claims. The Office Action relies on Stinson to allegedly disclose such limitations.

As discussed previously, Bach's light source 14 is perpendicular to Bach's bar 12 as is illustrated in Bach's Figs. 2 and 4. Substituting Stinson's variable color LED in the position of Bach's light sources 14,32 would not properly "align the one or more light emitting diodes (LEDs) of the first circuit board with the first opening and the first end of the rotatable acrylic rod" as recited in amended claims 1 and 31. More specifically, such a substitution would not place the "optical axis of each of the one or more light emitting diodes (LEDs) [] substantially in parallel with the central optical axis of the rotatable acrylic rod" as recited in amended claims 1 and 31.

Substituting Stinson's variable color LED in the position of Bach's light sources 14,32, no longer would Bach's first light source 14 emit[] light in all directions." [Bach, Col. 2, lines 40-41]. Substantial modifications to the physical structures of Bach would be required in order to properly replace Bach's light sources 14,32 with Stinson's variable color LED.

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It is not a proper ground of rejection when the "suggested combination of references would require a substantial reconstruction and redesign of the elements." [MPEP § 2143.01(VI), 8th Edition, Rev. 3, August 2005, Pg. 2100-138 citing *In re Ratti*, 270 F2d. 810, 123 USPQ 349 (C.C.P.A. 1959)].

Accordingly, Applicant respectfully submits that it would not have been obvious to one of ordinary skill in the art at the time the invention was made to combine Bach, Yamashita and Stinson.

Moreover, dependent claims 2-3, 6, 9, 11-18, 19-20; 22-26, 30; and 32-33, 35-47 depend respectfully from independent claims 1; 21; and 31. Applicant believes that it has placed independent claims 1, 21, and 31 in condition for allowance such that claims depending there-from with added limitations are also in condition for allowance.

D) Conclusion

For the foregoing reasons, Applicant respectfully requests that the Examiner withdraw all 35 U.S.C. § 103(a) claim rejections of claims 1-4, 6, 9-18, 19-20, 21-22, 23, 24-26, 30-33, 35, 38-45, and 46-47.

VIII) NEW CLAIMS

Applicant has added new dependent claims 52-63.

New Claim 52 depends directly from independent claim 7.

New Claim 53 depends directly from independent claim 8.

New Claim 54 depends indirectly from independent claim 1.

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New Claims 55-61 depend directly or indirectly from independent claim 21.

New Claims 62-63 depend directly or indirectly from independent claim 31.

Applicant believes that it has placed independent claims 1, 7-8, 21, and 31 in condition for allowance such that claims depending there-from with added limitations are also in condition for allowance. Thus, Applicant believes that new claims 52-63 are also in condition for allowance.

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CONCLUSION

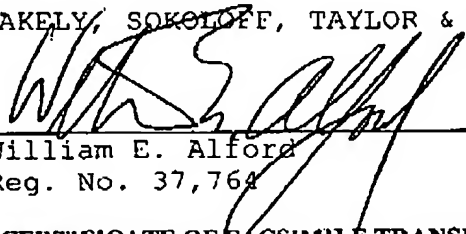
In view of the foregoing it is respectfully submitted that the pending claims are in condition for allowance. Reconsideration of the rejections and objections is respectfully requested. Allowance of the claims at an early date is solicited.

The Examiner is invited to contact Applicant's undersigned counsel by telephone at (714) 557-3800 to expedite the prosecution of this case should there be any unresolved matters remaining. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees in connection with the filing of this paper, including extension of time fees, to Deposit Account 02-2666 and please credit any excess fees to such deposit account.

Respectfully submitted

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

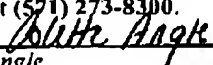
Dated: February 16, 2006


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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being transmitted via facsimile to the Patent and Trademark Office under 37 C.F.R. §1.8 on: February 16, 2006 to Examiner Ismael Negron at (571) 273-8300.


Colette Angle

2/16/06

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Appendix I

In re Hutchison
69 USPQ 138 (CCPA 1946)

Docket No: 5396P001C

patents provides mechanism which operates in synchronism with cutting rollers, feeding rollers, and folding rollers. It is true that the prior art mechanisms differ in some minor respects from that defined by the appealed claims. However, the tribunals of the Patent Office [1] concurred in holding that such differences as existed involved mere mechanical equivalents, which accomplished substantially the same thing in substantially the same way, and that, therefore, the mechanism defined by the appealed claims was not patentable over the disclosures in the reference patents. See *Dow Chemical Co. v. Halliburton Oil Well Cementing Co.*, 324 U. S. 320, 339 [64 USPQ 412, 416].

It will be recalled that the patent to Campbell (No. 1,818,437) discloses a tacker blade having nailing engaging fingers. Although such fingers may differ from the fingers in appellants' structure, that distinction is not set forth in the appealed claims. Furthermore, there is no evidence of record to indicate that there would be any invention in providing the folder blades in the Campbell patent No. 1,666,036 with nailing engaging fingers.

We have carefully considered the arguments presented here by counsel for appellants, but are unable to hold that the tribunals of the Patent Office erred in rejecting the appealed claims.

For the reasons stated, the decision of the Board of Appeals is affirmed.

33 C.C.P.A. (Patents) 870

Court of Customs and Patent Appeals

In re HUTCHISON

Appl. No. 5123 Decided Mar. 6, 1946

PATENTS

1. Pleading and practice in Patent Office Case under dual prosecution practice has statements of two examiners although references cited by both were same and all appealed claims might have been considered in same division.

2. Appeals to Court of Customs and Patent Appeals—issues to be determined.—Ex parte patent cases

Court is not concerned with allowed claims in instant division or its parent patent; rejected claims are not compared

with allowed claims in division or with parent claims.

3. Construction of specification and claims—Broad or narrow Functional statements therein do not limit article claims.

4. Construction of specification and claims—Introductory phrase

Statement in introductory phrase that article is "adapted" for specific use is not limitation in patentable sense.

Particular patents—Templates

Hutchison, Fabrication of Templates or the Like, claims 42, 43, 54, 55, 57, and 58 of application refused.

Appeal from Board of Appeals of the Patent Office.

Application for patent of Miller Reese Hutchison, Serial No. 416,384, filed Oct. 24, 1941; Patent Office Divisions 7 and 56. From decision rejecting claims 42, 43, 54, 55, 57, and 58, applicant appeals. Affirmed.

MORRISON, KENNEDY & CAMPBELL, New York, N. Y. (LUTHER E. MORRISON, New York, N. Y., and EDWARD H. PARRY, JR., Washington, D. C., of counsel) for appellant.

W. W. COCHRAN (E. L. REYNOLDS of counsel) for the Commissioner of Patents.

GARDERT, Presiding Judge.

This is an appeal from the decision of the Board of Appeals of the United States Patent Office affirming decisions of primary examiners rejecting certain product claims of appellant's application, Serial No. 416,384, filed October 24, 1941, relating, as recited in the specification, "to a process for immunizing hygroscopic sheet materials against dimensional variations and to the product thereof."

As hereinafter more fully explained, the claims here involved are directed to the particular kind of laminated material from which templates—that is, gauges or patterns for use as guides in forming the desired finished article—may be made.

The claimed invention was described in the decision of the board as follows:

It is disclosed that applicant proposes to immunize hygroscopic sheet material, such as ordinary drawing paper and the like, against dimensional variations resulting from changes in atmospheric moisture by adhering them to backing elements which themselves are immune to such changes, for example, metal or glass. It is disclosed that a water-proof ther-

moplastic is used as an adhesive to effect a bond between the sheet material and the backing element. Claim 42, for example, calls for an article of manufacture as a laminated unit comprising a backing element surfaced with paper having an exposed outer surface to receive the design and composed of metal stock of requisite thickness and rigidity to become the finished template and capable of being machined, the surfacing paper bonded to the metal backing element by a water-proof heat-set and heat-resistant adhesive.

We also quote the following from the brief of the Solicitor for the Patent Office:

This material comprises a sheet of metal to which a sheet of drawing paper or a layer of photographic emulsion is secured by means of a heat-settable water-proof adhesive. Since it is intended that this composite sheet shall be machined to form a template, the adhesive selected must, of course, be one which will not soften at the temperature produced by machining. The fact that the paper is uniformly secured to the metal prevents distortion or change in size of the paper due to changes in moisture content, and thus preserves the dimensions of figures on the drawing paper or photographic layer.

Five process and nine product claims stand allowed.

There are six claims (all for the product) on appeal. They are numbered, respectively, 42, 43, 54, 55, 57, and 58.

[1] It appears that because of certain differences in the claims involved in the application procedure was had in the Patent Office under what is described in the statement of one of the examiners as the "Dual Prosecution Practice," claim 58 (as were the allowed claims) being passed upon by an examiner in Division 7, which division had general jurisdiction of the application, while other claims were passed upon by an examiner in Division 55. We understand from statements made during the oral arguments before us that the "Dual Prosecution Practice" was instituted comparatively recently. This is the first case of that character to come before us. The practice itself is immaterial to any issue here presented. The board, of course, had before it statements of two examiners, but each was confined to the particular claims before the different divisions. The references cited by both examiners were the same, and we may say that whatever may have been the situation with respect to

the allowed claims, so far as we can discern, applicant claim 58 might very well have been considered in the same division where the other appealed claims were passed upon.

The application as filed recited that it was a division of a co-pending application, 402,128, filed July 12, 1941, and by an amendment entered July 16, 1943, it was stated that the parent application "matured into patent No. 2,311,547, dated February 16, 1943." Appellant's brief refers to the patent a number of times, but no copy of it was included in the record certified to us and we find no reference to it, or to the parent application, in any of the decisions of the tribunals of the Patent Office, nor in the reasons of appeal. The brief of the Solicitor for the Patent Office states that it "apparently involves a method of making templates from laminated material, while the claims here involved are directed to the laminated material from which the templates are made." It seems to be the position of appellant that the here involved claims should be allowed "to supplement the protection afforded" by the issued patent.

It may be said that in the brief for appellant it is stated, in substance, that the laminated material for which patent is sought, "While, capable of more general application," is particularly designed for the manufacture of templates used in the mass production of airplane parts, and the brief describes in considerable detail the matter of riveting the fuselage and wings of aluminum alloy sheets to each other and to the frame. It is said "The rivets must freely pass through holes in the sheets, which attach to other sheets and to the frame, requiring that the holes be drilled with great care and accuracy." This, of course, is a general statement of a specific necessity in the manufacture of modern airplanes, and appellant asserts that the laminated material described in his specification when used in templates renders them immune from fluctuation or variation in dimension (which sometimes must be accurate to "a thousandth of an inch") by reason of temperatures, atmospheric moisture and other conditions which affect metal and paper.

Neither the specification nor the claims of the application mention airplanes. Much of the specification defines method but the product is also defined.

As has been stated, appellant has been allowed in this division application five process claims and nine product claims. Apparently (we accept the statements in the briefs before us) he was also al-

lowed method claims in the patent based upon the parent application.

[2] We are not concerned, of course, with the allowed claims in either the patent or in this application. The sole question for our determination is whether the six article claims on appeal were properly rejected below, and this we pass upon without further reference to, and without comparing them with, the claims of the patent or the claims which stand allowed in this application.

The board quoted claim 42 (prosecuted in Division 56) as "an example" of all the claims. It paraphrased claim 58 (prosecuted in Division 7) but did not quote the text.

We here quote both (and in quoting them follow the italicization used by appellant in his brief to indicate the limitations which he insists render the claims patentable):

42. As an article of manufacture, adapted for use in the fabrication of a metal template or the like suitable for metal-working operations, a laminated unit comprising a backing element surfaced with paper having an exposed outer surface to receive the template design, said backing element being composed of metal stock possessing the requisite thickness and rigidity to become the finished template and capable of being machined under heat generating conditions in accordance with the template design, and said surfacing paper being bonded to the metal backing element by a water-proof heat-set and heat-resistant adhesive which renders the paper immune from plane dimensional variations resulting from changes in atmospheric moisture, and said adhesive being set under temperature and time conditions which produce a bond between the surfacing paper and the metal backing element that is unaffected by the heat generated during said template machining operations, the heat-resistant temperature of the heat-set adhesive being well above 212° F.

58. As an article of manufacture, adapted to be adhered to a metal backing element for use in the fabrication of a template or the like suitable for metal-working operations, which metal backing element possesses the requisite thickness and rigidity to become the finished template and which is capable of being machined under heat generating conditions in accordance with the template design produced thereon after the adherence of the article, a flexible sheet material having one surface coated with an unperforated light-sensitive photographic emulsion for the

printing of the template design and the opposite surface coated with a water-proof heat-setting and heat-resistant adhesive which, once set, renders the material immune from plane dimensional variations resulting from changes in atmospheric moisture, the temperature and time conditions required for the setting of the adhesive being such that, when the sheet material is bonded to the metal backing element, said bond will be unaffected either by the solutions used in the processing of the photographic emulsion after the printing exposure or by the heat generated during said template machining operations, the heat-resistant temperature of the heat-set adhesive being well above 212° F.

In the introductory clause of claim 43 it is stated that the article is adapted for use in a photographic process (a feature present in other of the claims) and the claim also states that the thickness of the metal is "many times the thickness of the drawing paper." Claim 54 is drawn to a coated paper layer "adapted to be adhered to a metal backing." Claim 56 describes the metal as steel stock having a thickness of one sixteenth of an inch. No thickness is mentioned in the specification and the one sixteenth of an inch definition seems to have been inserted by amendment during the prosecution of the application. Claim 57 calls for photographic paper instead of drawing paper.

The examiner in Division 7 (which had general jurisdiction of the application) in rejecting claim 53 cited the following patents as references:

Linderman 2,000,528 May 7, 1935
Rojas 2,318,184 May 4, 1943
Moxon (Br.) 1,97,061 May 10, 1923

He applied a double rejection, that is "on Linderman alone and also on Rojas or Moxon in view of Linderman." The examiner in Division 56, in rejecting the other claims cited the same references.

He first discussed claim 42 and held it to be anticipated by the "Rojas, Moxon and Linderman" patents, and in substance, held the same with respect to claims 43, 54, 56, and 57.

The board followed generally the decisions of the respective examiners, but specifically mentioned (although it did not overrule the others) only Linderman in affirming the examiner's rejection of claim 58.

In the brief for appellant the several claims are quoted, the limitations which his counsel regards as lending patentability to them being italicized, as in

claims 42 and 58 quoted, supra, and each limitation is discussed, in connection with the teachings of the cited prior art. We have studied these with much care but we do not deem it necessary to set forth all the refinements embraced in appellant's arguments. The claims are similar to each other and obviously they stand or fall together. Each of them contains functional statements which may not be regarded as limiting the claims, they being article claims.

[4] Taking first claim 42 for analysis and comparing it principally with the Moxon patent, the first phraseology italicized by appellant is the introductory clause to the effect that the laminated article is "adapted" for use in making a template or the like. This does not constitute a limitation in any patentable sense, but if it were in that category, it is anticipated by Moxon who teaches that his laminated sheet (made up of layers of paper and metal, united by an adhesive) may be used in making a template.

The second clause italicized is that relating to the composition of the backing element—metal stock—referring to its characteristics of thickness and rigidity. The Moxon patent discloses the use of a "thin" metal sheet which "may consist of an alloy of zinc and aluminum" to which "the [drawing] paper may be affixed in close contact with the sheet by means of an appropriate adhesive such as a waterproof gum * * *"

The third and fourth italicized clauses relate to the adhesive by which the paper is bonded to the metal backing, the manner of its setting, etc., to prevent variations resulting from changes in atmospheric moisture and from heat generated during the template machining operations. No particular adhesive material is named.

It seems obvious to us that all features of claim 42 are anticipated by the Moxon patent. Heat-set adhesives are admittedly old and the selection of one suitable for use in appellant's article would not involve invention. Machining necessarily generates heat and this would be present in Moxon.

The concluding part of the claim (a part common to all the appealed claims) refers to the heat resistant temperature of the heat-set adhesive as "being well above 212° F." This is not mentioned in the specification and we find nothing to indicate that it is a critical element.

The limitations which appellant emphasizes in claims 43, 54, 56, and 57, while couched in somewhat different phraseology, do not seem to differ in any patentable sense from those in claim 42.

The feature of photographic paper is definitely shown by Linderman, who also shows that the adhesive must be of a character resistant to the solutions used in the treatment.

So far as the feature of "steel stock" mentioned in claim 58 is concerned, it may be said that the specification does not define any particular metal, and the kind used would appear to be a matter of choice, and the "thickness" feature described in the claim is not shown to be critical.

With respect to claim 58, quoted supra, it will be observed that, in the final analysis, it is specific only to photographic paper coated with adhesive, the metal plate (as is stated in the brief of the Solicitor for the Patent Office) being "mentioned inferentially" and not positively included as an element.

We agree with the tribunals of the Patent Office that claim 58 fails to define invention over Linderman, particularly in view of the teachings of the other references.

Appellant has not convinced us that there was error in the rejection of the several appealed claims, and the decision of the board is affirmed.

22 C.C.P.A. (Patents) 895

Court of Customs and Patent Appeals

In re GREENBAUM

Appl. No. 5124 Decided Mar. 6, 1946

PATENTS

1. Patentability—Anticipation—In general

It is incorrect statement of law that prior publications and patents to anticipate invention must disclose invention in such full, clear, concise, and exact terms as to enable any one skilled in art to construct invention; claims are refused since references are sufficiently clear in disclosures to show non-invention.

Particular patents.—Ointment Greenbaum, *Antiseptic Ointment*, claims 3, 4, 6, and 7 of application refused.

Appeal from Board of Appeals of the Patent Office.
Application for patent of Frederick E. Greenbaum, Serial No. 452685; Patent

Appl. No. 10/615,433
Amdt. Dated 01/16/2006
Reply to Office Action of 08/16/2005

Appendix II

In re Boesch and Slaney
205 USPQ 215 (CCPA 1980)

Docket No: 5396P001C

estimates of the number of unauthorized bookings made by Budget of the film "Pygmalion." The figures totalled 136 bookings. In the stipulation, which was filed with the court on January 18, 1978, plaintiffs agreed that the booking figures "may be used by the Court . . . on the remaining issues." Primary of which was the issue of damages. Contained within the document but not stipulated to by the plaintiffs was a representation by defendants of their rental charges for the film per booking: \$25 from May 1972 to October 1976, and \$35 thereafter. The court eventually used these rental figures to calculate defendants' gross receipts for the stipulated bookings, each of which was found to constitute a separate infringement, to arrive at a total of \$3,700. Plaintiffs contend that, since they had not agreed to the rental amounts, as opposed to the bookings figures, the court erred in basing the gross receipts upon them. We cannot agree. The rental figures were identical to those that were advertised in Budget's catalogs for "Pygmalion." Plaintiffs have presented no reason to doubt their accuracy, and no contradictory evidence. We think the district court's utilization of those figures was reasonable under the cir-

" After the filing of the stipulation, the court ordered the parties to conduct any discovery necessary to assist the court in calculating the infringers' profits according to the following formula: the product of the number of bookings and the average rental fees per booking, less defendants' deductible costs. Defendants maintain that in compliance they conducted an exhaustive inspection of their records, which plaintiffs were welcome to, but did not, verify independently. This inspection apparently yielded a minimal profits figure, less costs, of \$153.96. Armed with the information that the stipulated bookings figure was overestimated, defendants sought to withdraw the stipulation unilaterally. This attempt was unsuccessful. The court rejected their figures, including their cost calculations, and, looking anew at the stipulation, found that it had provided the information needed to measure defendants' gross receipts. Defendants no longer challenge the court's calculation of damages. This was probably a wise concession. Were we to agree with defendants' earlier argument, we would have to remand and the district court might then properly and understandably exercise its discretion to award in lieu damages rather than to limit plaintiffs' recovery to the claimed de minimis profits. See *F.W. Woolworth, Inc. v. Contemporary Arts, Inc.*, supra note 20. * If anything, it is more reasonable to suppose that the film occasionally may have been rented at a discounted price, for example, as part of a package deal, than to suppose it was ever rented at a price exceeding the listed catalog price.

cumstances. Thus, we find that the profits figure yielded by the court's calculation was sufficiently certain to preclude application of the mandatory in lieu damages rule.

[10] Plaintiffs next argue that the district court abused its discretion by awarding them the infringers' profits of \$3,700 rather than statutory damages which at a minimum would amount to \$34,000. They rely in part on *Sid and Mary Knott Television Productions, Inc. v. McDonald's Corp.*, supra, as supporting the proposition that the court must weigh statutory damages against infringers' profits and award the higher sum. However, what was said in *Knott* was not that in lieu damages must be given if they benefit, but that they must not be given if they hurt plaintiffs. 562 F.2d at 1178-79 n.7. 196 USPQ at 114-116 n.7.

The cases cited by plaintiffs as affirming a discretionary award of statutory damages involved rejections by district courts of de minimis profits of the infringers as an alternative basis of recovery. *F.W. Woolworth Co. v. Contemporary Arts, Inc.*, supra (gross profits under \$900); *Key West Hand Print Fabrics, Inc. v. Serbin, Inc.*, 269 F.Supp. 605, 615, 155 USPQ 130, 132-133 (S.D. Fla. 1966) (infringer made no profit), aff'd, 381 F.2d 735, 155 USPQ 113 (5th Cir. 1967). The courts there had every reason to award higher compensation for the plaintiffs' substantial but unprovable damage than what the defendants had realized from their infringing activity. We are not faced with a similar situation in this case. The gross profits figure here can hardly be described as de minimis. We think the amount sufficient "to discourage wrongful conduct" without necessitating resort to in lieu damages to effectuate that purpose of copyright policy. *Woolworth*, 344 U.S. at 233, 95 USPQ at 398. We find no abuse of discretion and consequently affirm the damage award.

IV. Attorneys' Fees

[11] The copyright statute authorizes the district court in the exercise of its discretion to award reasonable attorneys' fees to the prevailing party. 17 U.S.C. §116. This court could reverse an order allowing such fees only for abuse of discretion. See *Monogram Models, Inc. v. Industro Motive Corp.*, 492 F.2d 1281, 1288, 181 USPQ 425, 429 (6th Cir.), cert. denied, 419 U.S. 843, 183 USPQ

* The award of \$10,000 in attorneys' fees here no doubt provides additional deterrence to would-be infringers.

321 (1974). While the \$10,000 awarded plaintiffs in fees might be considered generous when compared with the amount recovered in damages, the fees do not appear unreasonable considering the amount of work necessitated and performed and the skill employed. See also *Key West Hand Print Fabrics*, 269 F.Supp. at 615-16, 155 USPQ at 132-133. There was no abuse here.

However, we deny plaintiffs' application for allowance of additional attorneys' fees on appeal. We assume counsel was familiar with the law, having made similar arguments in district court on all the issues raised on appeal. See *Monogram Models*, 492 F.2d at 1288, 181 USPQ at 429. The appeal was not frivolous. Plaintiffs did not prevail on their cross appeal. Equity considerations lead us to permit the parties to pay their own attorneys' fees in this court. The plaintiffs are entitled to costs. Affirmed.

Court of Customs and Patent Appeals

In re Boesch and Slaney

No. 79-597

Decided Mar. 13, 1980

PATENTS

1. Patentability — Invention — In general (§§1.501)

Patentability — Invention — Specific cases — In general (§§1.5091)

Discovery of optimum value of result effective variable in known process is ordinarily within skill of art.

2. Patentability — Composition of matter (§§1.50)

Patentability — Evidence of — In general (§§1.451)

Patentability — Evidence of — Composition with allowed claims or patents (§§1.457)

Patentability — Invention — In general (§§1.501)

Patentability — Invention — Specific cases — In general (§§1.5091)

Prima facie case of obviousness may be required, where results of optimizing variable, which was known to be result effective, are unexpectedly good; proof of unexpected properties may be in form of direct or indirect comparative testing of claimed compounds and closest prior art.

3. Patentability — Composition of matter (§§1.50)

Patentability — Evidence of — In general (§§1.451)

Patentability — Evidence of — Composition with allowed claims or patents (§§1.457)

Patentability — Invention — Specific cases — Chemical (§§1.5093)

Data that compares four examples of claimed alloys with one example of prior art alloy and is intended to show unexpected results are not commensurate in scope with claims for broad range of elements in case in which weight percent of elements in four examples of claimed alloys vary by relatively minor amounts, for example, entire claimed range of carbon is .18 percent, but tested range is only .02, and claimed cobalt range is 4.8, but test range is only 1.3, and there is no evidence showing whether other alloys encompassed by these broad claims and having elements varying by relatively major amounts also exhibit unexpected results.

4. Patentability — Composition of matter (§§1.50)

Patentability — Evidence of — In general (§§1.451)

Patentability — Evidence of — Composition with allowed claims or patents (§§1.457)

Patentability — Invention — Specific cases — Chemical (§§1.5093)

Test results involving single alloy within broad range claimed are not sufficient to support appellants' allegation of what would, from prior art, be unexpected under circumstances in which essential concept of invention is to maintain average number of electron vacancies at value not exceeding about 2.35. Prior art teaches that reduction of Nv value reduces the chances of sigma phase in alloy; appellants allege that alloys of Nv value reduce the chances of sigma phase in alloy; appellants allege that alloys meeting their composition and Nv value requirements are free from sigma phase, and appellants tested only one example of low Nv value alloy and found no sigma, which is result consistent with both prior art

teaching and appellants' allegation that their claimed alloys are totally free from sigma phase; where it is alleged that certain technique for flipping coins would always produce "heads," one would hardly be persuaded by single loss of coin that resulted in showing of "heads."

Particular patents — Nickel Alloys

Boesch and Slaney, Temperature Nickel Based Alloy and Process of Making Same, rejection of claims 1 and 8-15 affirmed.

Appeal from Patent and Trademark Office Board of Appeals.

Application for patent of William J. Boesch and John S. Slaney, Serial No. 387,776, filed June 17, 1975. From decision rejecting claims 1 and 8-15, applicants appeal. Affirmed.

Robert F. Drotkin and Vincent G. Gioia, both of Pittsburgh, Pa., for appellants.

Joseph F. Nakamura (John W. Dewhurst, of counsel) for Commissioner of Patents and Trademarks.

Before Markey, Chief, Judge, Rich, Baldwin, and Miller, Associate, Judges, and Maltz, Judge.

Miller, Judge.

This is an appeal from a decision of the Patent and Trademark Office ("PTO") Board of Appeals ("board") which sustained the examiner's rejection under 35 USC 103 of appellants' claims 1 and 8-15 in view of Lamb's and Pehlman' et al. We affirm.

Background

The invention embraces nickel base alloys consisting essentially of

Metals	Percentage Ranges
aluminum	4.0 - 4.7
boron	0.005 - 0.03
carbon	0.0 - 0.18
chromium	13.7 - 15.3
cobalt	14.2 - 19.0
iron	0.0 - 4.0
molybdenum	3.8 - 4.8
titanium	3.0 - 3.7

* The Honorable Herbert N. Maltz of the United States Customs Court, sitting by designation.

* Serial No. 387,776 was filed on June 17, 1975.

* U.S. patent No. 3,147,155, issued September 1, 1964.

* U.S. patent No. 3,457,066, issued July 22, 1969.

the alloy being characterized by its freedom from precipitation of deleterious amounts of sigma-like phase after exposure at temperatures in excess of 1500°F for periods of time in excess of 1000 hours.

Prior Art

Lamb discloses a process for hot working age-hardenable nickel-chromium alloys. The alloys contain:

Metals	Percent by Weight
aluminum	4.0 - 5.4
boron	0.003 - 0.1
chromium	14.0 - 16.0
carbon	0.01 - 0.2
cobalt	14.0 - 25.0
molybdenum	3.0 - 5.5
titanium	3.0 - 4.6
zirconium	0.01 - 0.2

A sample alloy is heated at 1190°C for 1.5 hours and cooled to 1000°C at about 1°C per minute, after which it may be hot worked at 1120°C. When hot working is complete, the alloy will generally require a further heat treatment to develop full creep resisting properties.

Pohlman et al. disclose nickel base alloys suitable for elevated temperature operation containing:

TABLE I

CHEMISTRY-WEIGHT PERCENT

Heat No.	C	Cr	Al	Co	Fe	Mo	Ti	Al	B	Ni
D1-379-1	0.01	15.3	8al.	17.9	—	4.5	3.6	4.7	0.023	2.53
D1-379-2	0.04	15.3	8al.	17.9	—	4.6	3.6	4.7	0.022	2.54
D1-380-1	0.06	15.3	8al.	17.5	1.0	4.6	3.6	4.7	0.021	2.51
D1-380-2	0.06	15.1	8al.	17.4	3.5	4.5	3.5	4.6	0.020	2.40
D1-382	0.06	15.3	8al.	18.5	—	4.3	3.5	4.4	0.019	2.47
D1-383	0.06	15.2	8al.	17.7	—	4.3	3.6	4.4	0.020	2.43
D1-386	0.06	15.3	8al.	18.1	—	4.7	3.4	4.6	0.021	2.49

The Boesch Affidavit

Seven heats of alloys (appellants' Table I below), which were within the claimed composition ranges but whose Ni values varied from 2.40 to 2.54 (all clearly above the upper limit of 2.35 set forth in the claims), were processed and heat treated. Appellants' Table II shows that all seven heats contained sigma phase.

The remainder of the alloys comprises nickel and incidental impurities. The elements in the alloys are balanced to provide an N_v value not in excess of about 2.35¹ according to the following equation:

$$N_v = 4.66 (\text{A}\% \text{Cr} + \text{A}\% \text{Mo}) + 1.71 (\text{A}\% \text{Co}) + 0.61 (\text{A}\% \text{Ni})$$

In the case of alloys within the board range set forth above, but not balanced to meet the required N_v value, room temperature ductility deteriorates, and creep deformation increases, after prolonged exposure at elevated temperatures. Appellants state that these results are attributable to formation of a deleterious phase (known as "sigma phase") in the metal after such exposure, and that the tendency of an alloy to form sigma phase is (unexpectedly) eliminated by balancing the relative amounts of its constituent elements in accordance with the N_v equation. Where the composition of an alloy has been controlled to provide an N_v value of about 2.35 or less, no sigma has been found after exposure at 1500°F for time periods up to 7200 hours.

Claim 1 is illustrative:

1. A nickel base alloy having a composition consisting essentially of up to 0.18% carbon from about 14.2% to about 19.0% cobalt, from about 13.7% to about 15.3% chromium, from about 3.8% to about 4.8% molybdenum, from about 3.0% to about 3.7% titanium, from about 4.0% to about 4.7% aluminum, up to about 4.0% iron, from 0.005% to about 0.03% boron and the balance essentially nickel with incidental impurities, the aforementioned elements being balanced to provide an N_v value not in excess of about 2.35 according to the following equation:

$$N_v = 4.66 (\text{A}\% \text{Cr} + \text{A}\% \text{Mo}) + 1.71 (\text{A}\% \text{Co}) + 0.61 (\text{A}\% \text{Ni})$$

¹ N_v refers to the average electron vacancy concentration per atom in the matrix of the alloy. Appellants state that the overall variation in N_v due to chemical uncertainty is +0.25 so that in reality the N_v value of about 2.35 may actually extend from 2.32 to 2.38.

* Appellants' specification states that A% refers to the atomic percent of the element so described.

* Creep is the permanent deformation of a metal that occurs as a result of prolonged compression or extension at or near room temperature. The Condensed Chemical Dictionary 228 (8th ed. 1971).

The board also said that the showing (in the specification, set forth *infra*) did not establish the asserted criticality in selection of the components of the alloys according to the claimed N_v formula, because the alloys failed to meet the claimed compositional and N_v value requirements.

TABLE II

Heat No. Approximate w/o Sigma

D1-379-1 1.4

D1-379-2 0.9

D1-380-1 0.4

D1-380-2 0.05

D1-382 0.05

D1-383 0.3

D1-386 0.3

The affidavit states that "any amount of sigma phase is deleterious and undesirable because of the susceptibility to embrittlement failure, following exposure to high temperature."

The Board

The board agreed with the examiner that the claimed alloys were prima facie obvious from the prior art, noting that there was no substantial disagreement that both Pahlman et al. and Lamb disclose alloys having compositional limits overlapping those of the claimed alloys. Although disagreeing with the examiner's contention that there was no evidence to support the statement in the Bosch affidavit that "any amount of sigma phase is deleterious and undesirable," it agreed with the examiner that the Bosch affidavit was insufficient to overcome the prima facie case of obviousness because there was no evidence showing:

- (1) the precise amounts of sigma-like phase present in compositions containing Appellants' claimed components balance to provide N_v values just inside versus just outside Appellants' claimed "about 2.35" N_v limits; and (2) direct comparisons of sufficient mechanical properties of those compositions within and without the claimed limit, to demonstrate the alleged critical correlation of N_v limit with sigma phase content.

The board agreed with the examiner that there [was no evidence showing] that an alloy

Opinion

The Prima Facie Case

Each of the ranges of constituents in appellants' claimed alloys overlaps ranges disclosed by Pahlman et al. and Lamb. Appellants, citing *In re Waymouth*, 499 F.2d 1273, 182 USPQ 290 (CCPA 1974), argue that neither of the cited prior art references recognizes the problem solved by them and, therefore, cannot render the claims obvious. Upon examination of the prior art references, we do not agree. Appellants admitted in their specification that:

It has been postulated according to Pauling's theory that the criterion for the formation of sigma phase is based upon the number of electron vacancies (N_v) in the bonding orbitals of the elements involved. Based thereon, other investigators have derived an empirical equation which includes the elements chromium, molybdenum, manganese, iron, cobalt and nickel. It is to be noted, however, that the nickel base alloys to which reference is made in the present invention relate to an iron-free or low-iron composition, with only incidental amounts of an element such as manganese, and are hardened by the aluminum and titanium rich intermetallic compound gamma prime.

U.S. patent No. 3,837,838 ('838), filed December 18, 1972, and issued September 24, 1974, was introduced into evidence by appellants and further illuminates what is meant by "Pauling's theory."

As described in an article by Linus Pauling entitled "The nature of interatomic forces in metals," published in *Physical Review*, 54:899, 1938, in a given metallic atom, the outer most orbitals, termed the bonding orbitals, are occupied by the bonding electrons responsible for bonding the atom to its neighboring metallic atoms. At a given instant in time and on the average, the bonding orbitals

having an N_v number of 2.35 is free of any amount of sigma phase, or what the sigma phase content and properties are of an alloy having an N_v number of 2.36 which is close to but outside the N_v requirement."

are only partially occupied by the bonding electrons. Such partial occupation means that the outer orbitals are partially vacant of electrons or possess an "electron hole." The total average number of vacant orbitals in a given metallic atom is called the electron hole number of the metal (N_v). The average electron hole number (N_v) is the resultant of adding all N_v for the participating elements in the alloy matrix. The higher the N_v of a given Co-Cr-Ni alloy the higher the chance for the precipitation of embrittling phases. The quantities of metals consumed in precipitation do not enter in calculating N_v of the alloy matrix and hence do not participate in the formation of embrittling phases. A low N_v may thus be obtained by either choosing elements of low N_v to form an alloy or by using elements that will react in the alloy and precipitate out from the alloy matrix.

Accordingly, in carrying out this invention, I have selected an alloy-base for the system which possesses a low N_v , and have strengthened the alloy base by adding elements which will have minor or no effect on raising the N_v through controlling their percentage as solutes or by eliminating their effect on N_v by formation of compounds which precipitate out.

It appears from appellants' specification that certain precipitate-hardened nickel base alloys, after being exposed to elevated temperatures for prolonged periods of time, suffered "from a marked and catastrophic decrease in room temperature ductility and a marked increase in the rate of creep deformation." It was observed that other nickel base alloys having the same percentage ranges of components did not suffer such deleterious changes. The cause of the problem was believed to be the formation of an embrittling phase ("sigma"). As early as 1938, however, it was known that the higher the N_v value of a Co-Cr-Ni alloy, the higher the chance for precipitation of embrittling phases; also, that the quantities of metals consumed in precipitation did not enter into

calculating the N_v value of an alloy matrix. We are persuaded that one of ordinary skill in the art would have been guided by these principles.

[1] In the above-quoted passage from '838, we note that lowering the N_v value of a Co-Cr-Ni alloy and deletion of the metals not consumed in precipitation from the N_v calculation are expressly suggested. Considering, also, that the composition requirements of the claims and the cited references overlap, we agree with the Solicitor that the prior art would have suggested "the kind of experimentation necessary to achieve the claimed composition, including the proportional balancing described by appellants' N_v equation." This accords with the rule that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Antonic*, 539 F.2d 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). Accordingly, we conclude that a prima facie case of obviousness has been established.

Impeached Recalls

[2] It is well settled that a prima facie case of obviousness may be rebutted "where the results of optimizing a variable, which was known to be result effective, [are] unexpectedly good." *In re Antonic*, supra, 539 F.2d at 620, 195 USPQ at 8-9, and cases cited therein. It is also well settled that proof of direct or indirect comparative testing of unexpected properties may be in the form of the claimed compounds (here, alloys) and the closest prior art. *In re Payne*, 606 F.2d 303, 316, 203 USPQ 245, 256, (CCPA 1979), and cases cited therein.

A. Creep Tests

Table V, set forth in appellants' specification and shown below, compares four examples of the claimed alloys with one example (6-3211) of a prior art alloy and is intended to show that the measured creep of the claimed alloys is unexpectedly less than that of the prior art.

TABLE V

Creep Tests at 1500°F and 37,000 psi

Alloy No.	Sample Removed After (Hours)	Measured Creep (Inches per inch)
2-1422	1567.8	0.008
2-1423	1500.4	0.004
2-1425	1504.5	0.010
2-1426	1500.4	0.004
6-3211	1503.1	0.034

Court of Customs and Patent Appeals
In re Breslow
No. 79-602
Decided Feb. 28, 1980

PATENTS

- 1. Patent grant — In general (§50.01)
Patent grant — Nature of patent rights
— In general (§50.201)

Government grants only right to exclude; there is no other agreement, analogy of a patent to a contract on theory that it is issued in exchange for invention's disclosure; "consideration" is inexact; patent is statutory right; it is granted to "Whoever" fulfills conditions, Section 101, unless fraud has been committed.

- 2. Court of Customs and Patent Appeals
— Issues determined — Ex parte patent cases (§28.203)

Question of whether claimed compounds "are even formed" on which point Board of Appeals disagreed with examiner who argued that there was no indication nor proof on this point and board expressly held to contrary is not before Court of Customs and Patent Appeals.

- 3. Patentability — Subject matter for patent monopoly — In general (§51.601)

Ex parte Howard, 328 O.G. 251, 1924 C.D. 75, dealt with construction of "manufacture" rather than "composition of matter," with gob, of at least obvious, molten glass in transitory state rather than novel chemical compounds, and with mechanical molding process in which it was well known to use molten gob of glass as distinguished from novel chemical process using entirely new and unobvious group of chemical compounds.

- 4. Patentability — New use or function
— Composition of matter (§51.555)
Patentability — Subject matter for patent monopoly — In general (§51.601)

In re Stubbs, 13 USPO 358, did not deal with issue of whether claimed compounds are excluded from category of "composition of matter" in Section 101 merely because they are transitory, unstable, and non-isolatable.

- 5. Patentability — New use or function
— Composition of matter (§51.555)

seven alloy examples; all of which meet the composition requirements but exceed the N_v value requirement of the claimed alloys. However, this affidavit contains no examples of claimed alloys showing the absence, or presence, of sigma. The remainder of the record reveals only a single example of the claimed alloy, which shows the absence of sigma. Appellants' specification includes a photomicrograph of Table V alloy heat 2-1422, which clearly shows the absence of sigma; also, a photomicrograph of Table V alloy heat 6-3211, which shows the presence of sigma. We note again that the prior art teaches that reduction of the N_v value reduces the chances of sigma phase in the alloy. Here appellants stated only one example of a low N_v value alloy and found no sigma — a result consistent with both the prior art teaching and appellants' allegation that their claimed alloys are "totally free from sigma phase." Under such circumstances, test results involving a single alloy within the broad range claimed are not sufficient to support appellants' allegation of what would, from the prior art, be unexpected.

In view of the foregoing we hold that appellants have failed to rebut the prima facie case of obviousness.

The decision of the board is affirmed.
Affirmed.

"Thus, appellants have again failed to show test data commensurate in scope with the broad claims."

"We agree with the board that the six United States patents (11) No. 4,093,474, issued June 6, 1978; (2) No. 4,083,734, issued April 11, 1978; (3) No. 3,930,004, issued January 6, 1976; (4) No. 3,837,838, issued September 24, 1974; (5) No. 3,816,110, issued June 11, 1974; and (6) No. 3,767,385, issued October 23, 1973) introduced into the record by appellants "do support the assertion in the Boesch affidavit that any amount of sigma phase is undesirable." Therefore, we have limited our analysis to the issue of the existence of sigma phase and have not extended it to include the effect of varying amounts of sigma phase."

"Where it is alleged that a certain technique for flipping coins would always produce 'heads,' one would hardly be persuaded by a single toss of a coin which resulted in a showing of 'heads.'"

The measured creep of 6-3211 — an alloy, appellants note, having "chemistries" within those of the references — is in excess of three to eight times greater than the creep of the claimed alloys.

The composition and N_v values of the alloy heats in Table V are as follows:

Chemical Analysis

Alloy No.	C	Al	Ni	Si	Fe	Mn	P	S	Other
2-1422	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2-1426	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
6-3266	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
6-3266	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Although it is apparent that the molybdenum content of 6-3211 exceeds the maximum content of the claimed alloys by 0.15%, it is clearly within the ranges of the Pohlman et al. and Lamb alloys.

[3] However, we are not persuaded that the Table V data are commensurate in

scope with appellants' claims. In re Greenfield, 571 F.2d 1185, 1189, 1977 USPQ 227, 230, (CCPA 1978). Appellants claim broad ranges of elements, but the weight percent of elements in the four examples of the claimed alloys vary by relatively minor amounts. For example, the entire claimed range of carbon is .18 percent, but the listed range is only .02 (.07 minus .05); the claimed cobalt range is 4.8, but the test range is only 1.3. There is no evidence showing whether other alloys encompassed by appellants' broad claims and having elements varying by relatively major amounts also exhibit a low creep rate.

TABLE VI
Room Temperature Tensile Tests

Alloy No.	Condition	U.T.S. psi	Offset Y.S. (psi)	Elong. (%)	R.A. (%)	N_v Value
2-1426	As-heat-treated	204,000	140,000	16.9	15.0	2.27
2-1426	As-heat-treated + exposed 5000 hrs. at 1500°F	157,000	100,000	16.1	14.1	2.27
6-3266	As-heat-treated	194,500	136,800	14.0	13.7	2.52
6-3266	As-heat-treated + exposed 5000 hrs. at 1500°F	150,500	117,500	5.0	5.5	2.52

The marked decrease in room temperature ductility (Elong.) after prolonged elevated temperature exposure of the prior art alloy (6-3266), compared to the claimed alloy's (2-1426) essentially unchanged ductility, is contended to show an unexpected result, as was the improvement in measured creep discussed earlier. However, for the same reason that the measured creep test data of Table V are not persuasive of unexpected results, we do not regard the tensile test data of Table VI, comparing only one heat of a claimed alloy, sufficient to rebut the prima facie case of obviousness of the claimed invention.

[4] As related earlier, the Boesch affidavit shows that sigma phase is present in

C. Absence of Sigma Phase
Throughout prosecution appellants have maintained that the claims define "a nickel

It is unnecessary to decide whether 6-3211 is the "best prior art." See In re Malagari, 699 F.2d 1297, 1302-03, 182 USPQ 549, 552-53, (CCPA 1974).

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